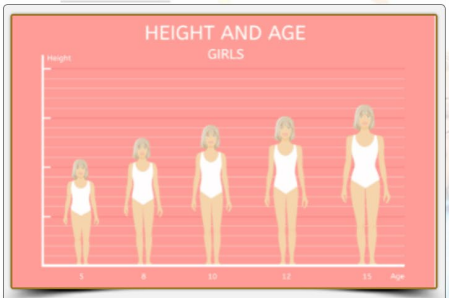
Boys Growth Charts: 2-18 years

(and how to read them)

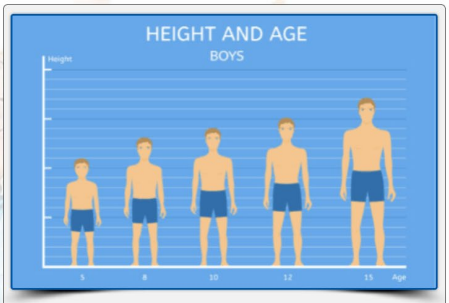
Queensland PAEDIATRIC ENDOCRINOLOGY

Wondering if your child is too short or too tall for their age?
Are they average height?
Do they have a healthy weight for height?
Here's our quick guide on how to read a growth chart, with Australian growth charts for boys below.

First, check you are using the correct chart for your child's age and sex



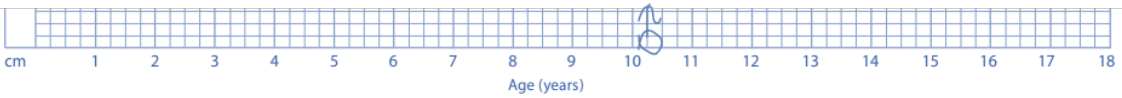
Growth Chart Girls - Australia (metric) | Height and Weight | 2 to 18 year old



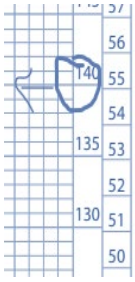
Growth Chart Boys - Australia (metric) | Height and Weight | 2 to 18 year old

To plot their height using the "Height Percentile" chart:

- Along the horizontal (x) axis, find your child's age

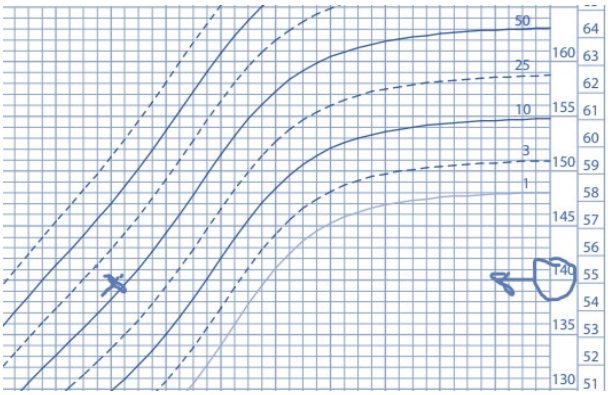


- Along the vertical (y) axis, find your child's height



- Trace a line upwards from their age (x) up to the line of their height (y), and mark the point where these two lines meet

The curved lines along the chart correspond to centiles.



- "Average height" corresponds to the 50th centile
  - On average 50% of children of the same age and sex will be taller than this, and 50% will be shorter.
  - Most children will 'find their centile' in the first couple of years of life, and then 'follow' this centile throughout childhood.

Many factors contribute to growth throughout childhood and puberty including nutrition, illness, and family history. Visit our website and FAQ for more information, or if you have questions or concerns book an appointment with your child's GP, who can arrange a referral to us at Queensland Paediatric Endocrinology as needed.

Queensland Paediatric Endocrinology. Suite 10A, 40 Annerley Rd Woolloongabba, Qld, 4102.

Pfizer Endocrine Care

Boys 2-18 years

Endorsed By Australasian Paediatric Endocrine Group

Pfizer Australia Pty Ltd
Sydney, Australia

Surname

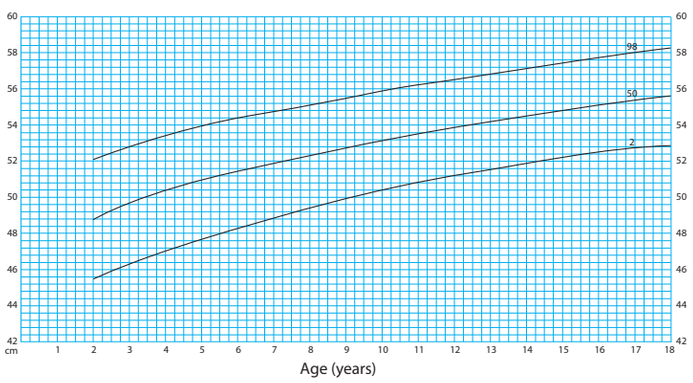
Given Names

Identification No.

Date of Birth

Head Circumference

Measuring Technique: The tape should be placed over the eyebrows, above the ears and over the most prominent part of the occiput taking a direct route. A paper tape is preferable to plastic, which stretches unacceptably under tension. The maximum measurement should be recorded to the nearest 0.1 cm.



Data Source: 2–5 yr: Jones, DL. NSW Health Communication publication 1973. 5-18 yr: Nellhaus, G. *Pediatrics* 1986; 41:106–114.

Height Velocity

The standards are appropriate for velocity calculated over a whole year period, not less, since a smaller period requires wider limits (the 3rd and 97th centiles for a whole year being roughly appropriate for the 10th and 90th centiles over six months). The yearly velocity should be plotted at the mid-point of a year. The centiles given in black are appropriate to children of average maturational tempo, who have their peak velocity at the average age for this event. The red line is the 50th centile line for the child who is two years early in maturity and age at peak height velocity, and the green line refers to a child who is 50th centile in velocity but two years late. The arrows mark the 3rd and 97th centiles at peak velocity for early and late maturers.

Centiles of a whole year velocity for maturers at average time

97th
90th
75th
50th
25th
10th
3rd

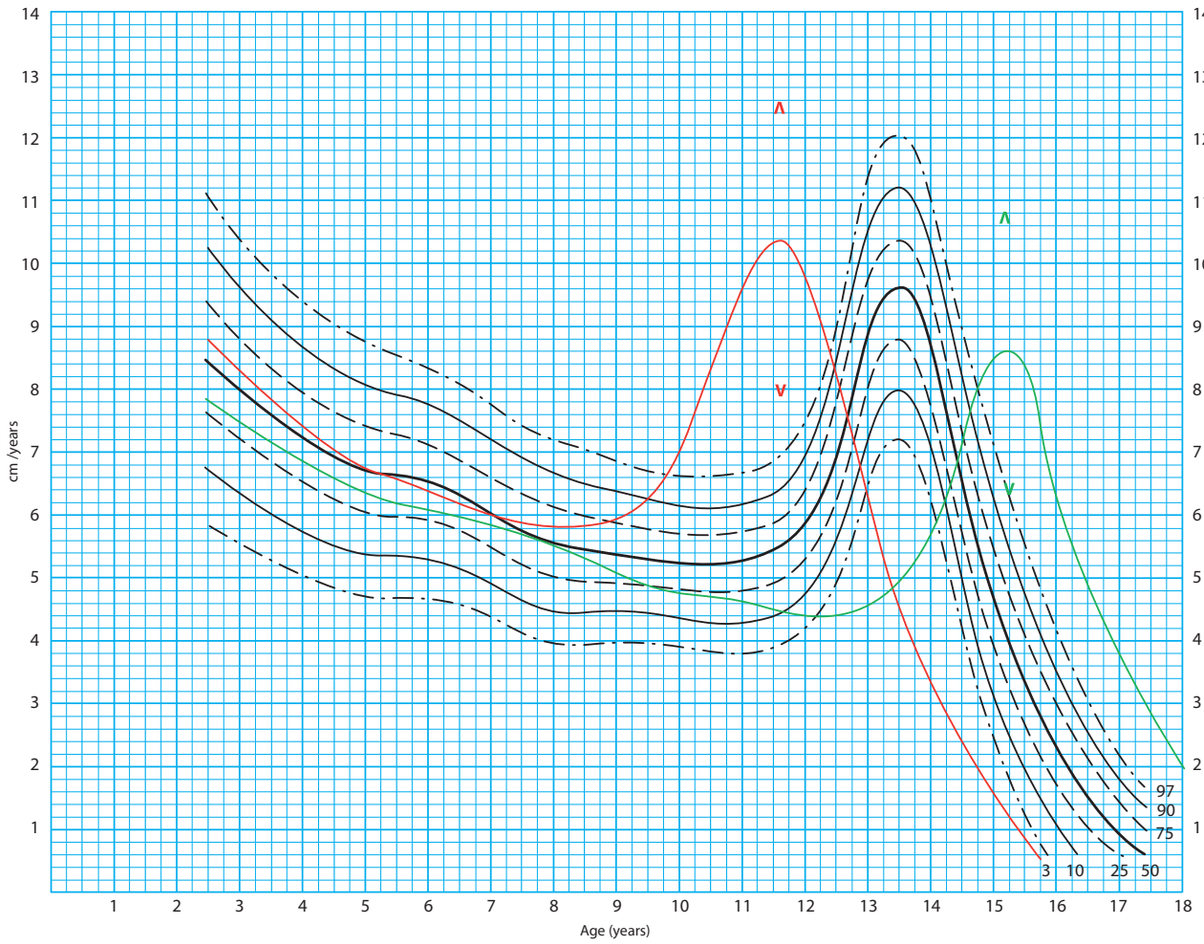
Centiles of a velocity

Early (+2SD) maturers

97th centile peak
50th
3rd centile peak

Late (-2SD) maturers

97th centile peak
50th
3rd centile peak



Data Source: Tanner J, Davies P. Clinical longitudinal standards for height and height velocity for North American children, *The Journal of Pediatrics* 1985;107(3):317-329.

Height Percentile

Mother's Height

Father's Height

Simplified Calculation of Body Surface Area (BSA)

$$BSA\ (m^2) = \sqrt{\frac{Ht\ (cm) \times Wt\ (kg)}{3600}}$$

Reference: Mosteller, RD, Simplified calculation of body surface area, *N. Engl. J. Med* 1987;317:1098

Supine Length (recommended up to the age of 3 so that there is overlap with standing height at 2 to 3) is taken on a flat surface, with the child lying on his back. One observer holds the child's head in contact with a board at the top of the table and another straightens the legs and turns the feet upward to be at right angles to the legs and brings a sliding board in contact with the child's heels.

Standing Height (recommended from age 2 onwards) should be taken without shoes, the child standing with his heels and back in contact with an upright wall. His head is held so that he looks straight forward with the lower borders of the eye sockets in the same horizontal plane as the external auditory meati (i.e. head not with the nose tipped upward). A right-angled block (preferably counterweighted) is then slid down the wall until its bottom surface touches the child's head and a scale fixed to the wall is read. During the measurement the child should be told to stretch his neck to be as tall as possible, though care must be taken to prevent his heels coming off the ground. Gentle but firm pressure upward should be applied by the measurer under the mastoid processes to help the child stretch. In this way the variation in height from morning to evening is minimised. Standing height should be recorded to the last completed 0.1 cm.

$$C = M[1 + L.S.Z]^{1/L}$$

Where C is the centile required, LMS are those parameters published by CDC and Z is the standard deviation equivalent to the centile required.

1st Centile calculated by Associate Professor Peter Davies, Children's Nutrition Research Centre, Brisbane.

CDC: Centers for Disease Control and Prevention

97th
90th
75th
50th
25th
10th
3rd
1 st

Height

cm: 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160

in: 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76

cm: 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190

97 90 75 50 25 10 3 1

Penis Stage: 5+ 4+ 3+ 2+

Pubic Hair Stage: 5+ 4+ 3+ 2+

Testes Vol.: 12mL 4mL

97 90 75 50 25 10 3

cm: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

in: 11 12 13 14 15 16 17 18

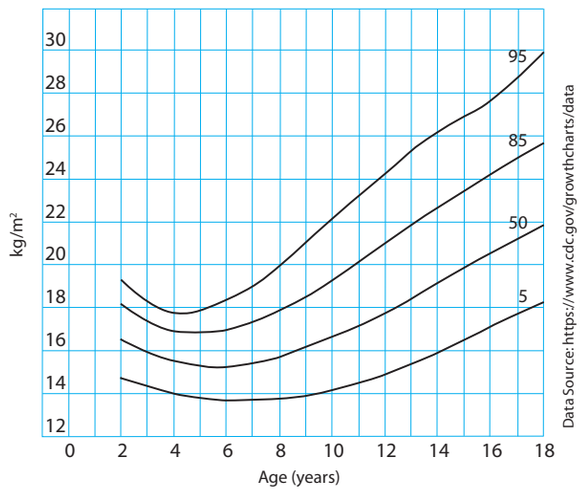
Age (years)

Data Source: https://www.cdc.gov/growthcharts/data/set1clinical/cj411021.pdf

Weight Percentile

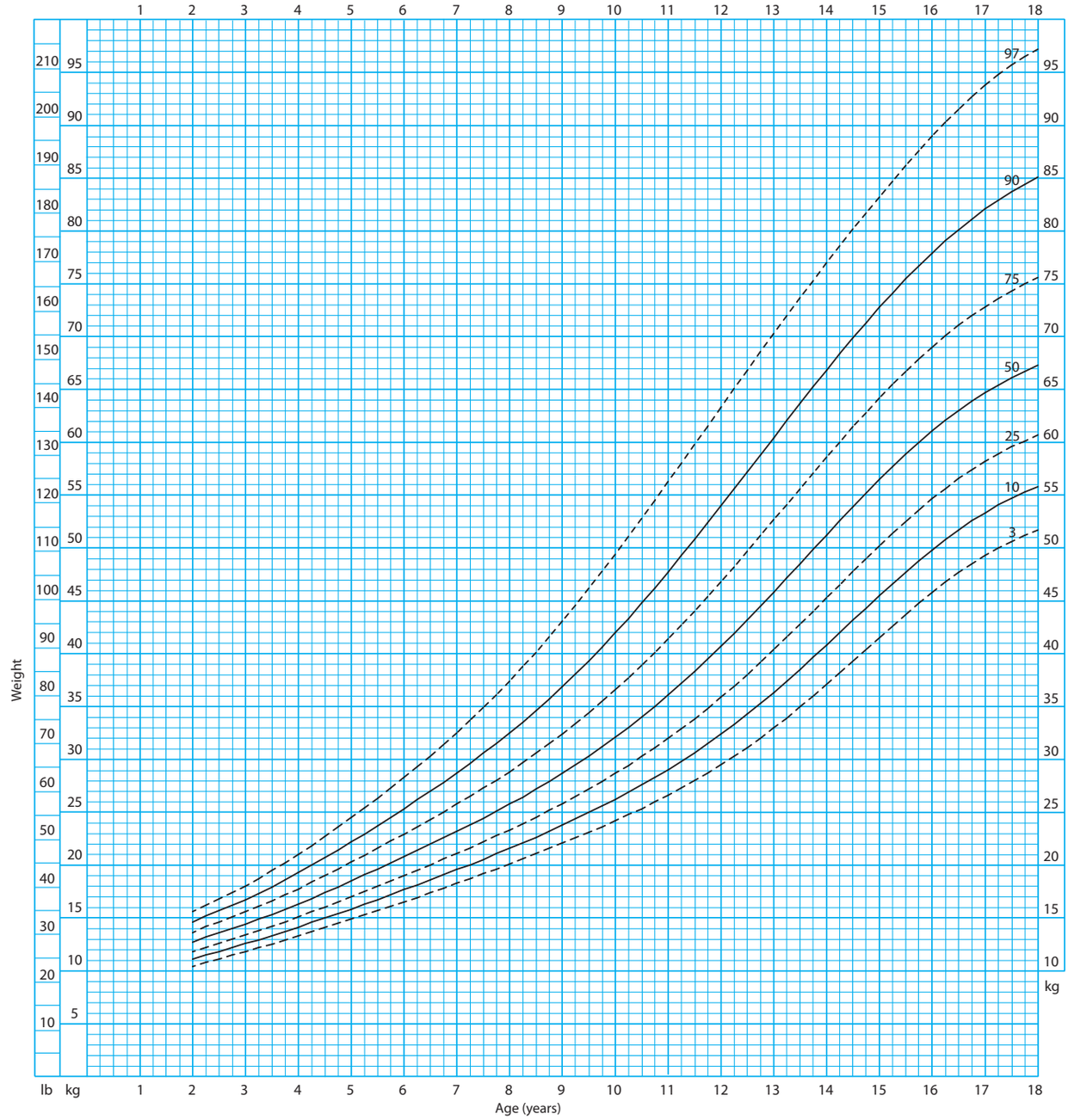
Weight should be taken in the nude, or as near thereto as possible. If a surgical gown or minimum underclothing (vest and pants) is worn, then its estimated weight (about 0.1 kg) must be subtracted before weight is recorded. Weights are conventionally recorded to the last completed 0.1 kg above the age of six months. The bladder should be empty.

Body-Mass Index



Data Source: https://www.cdc.gov/growthcharts/data/set1clinical/cj411023.pdf

					PUBERTAL STAGES			
DATE	AGE	HEIGHT	WEIGHT	HEAD CIRCUM.	GENITAL	PUBIC HAIR	TESTES L	TESTES R



Data Source: https://www.cdc.gov/growthcharts/data/set1clinical/cj411021.pdf

Boys 2-18 years

Stages of Puberty

Ages of attainment of successive stages of pubertal sexual development are given in the Height Percentile chart.
The stage Pubic Hair 2+ represents the state of a child who shows the pubic hair appearance stage 2 but not stage 3 (see below).

The centiles for age at which this state is normally seen are given, the 97th centile being considered as the early limit, the 3rd centile as the late limit. The child's puberty stages may be plotted at successive ages *(*Tanner. *Growth at Adolescence*, 2nd edn, 1962*)*. Testis sizes are judged by comparison with the Prader orchidometer *(*Zachmann, Prader, Kind, Haflinger & Budliger. 1974, *Helv. Paed. Acta*. 29, 61-72*)*.

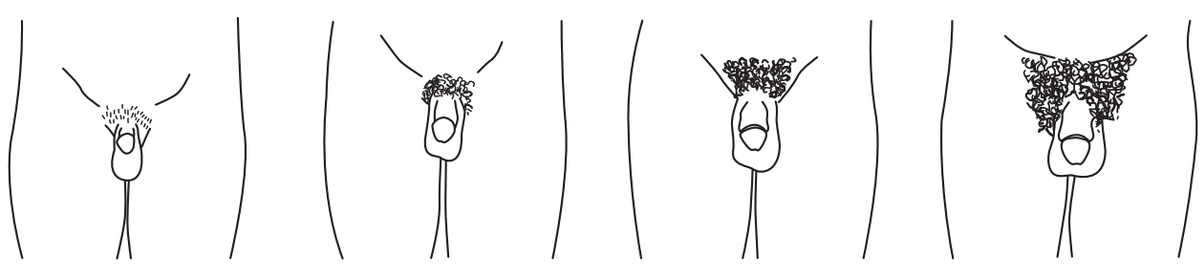
Genital (Penis) Development

Stage 1. Pre-adolescent. Testes, scrotum and penis are of about the same size and proportion as in early childhood.
Stage 2. Enlargement of scrotum and testes. Skin of scrotum reddens and changes in texture. Little or no enlargement of penis at this stage.
Stage 3. Enlargement of the penis which occurs at first mainly in length. Further growth of the testes and scrotum.
Stage 4. Increased size of penis with growth in breadth and development of glans. Testes and scrotum larger; scrotal skin darkened.
Stage 5. Genitalia adult in size and shape.

Pubic Hair Development

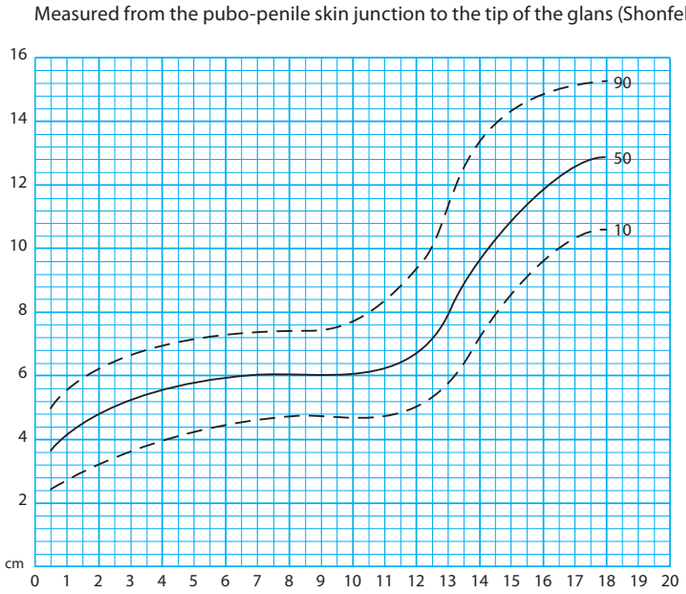
Stage 1. Pre-adolescent. The vellus over the pubes is not further developed than that over the abdominal wall, i.e. no pubic hair.
Stage 2. Sparse growth of long, slightly pigmented downy hair, straight or slightly curled at the base of the penis.
Stage 3. Considerably darker, coarser and more curled. The hair spreads sparsely over the junction of the pubes.
Stage 4. Hair now adult in type, but area covered is still considerably smaller than in the adult. No spread to the medial surface of thighs.
Stage 5. Adult in quantity and type with distribution of the horizontal (or classically 'feminine') pattern. Spread to medial surface of thighs but not up linea alba or elsewhere above the base of the inverse triangle (spread up linea alba occurs late and is rated stage 6).

Genital and Pubic Hair Development Stages



Stretched Penile Length

Measured from the pubo-penile skin junction to the tip of the glans (Shonfeld & Beebe. 1942, *Journal of Urology*, 48, 759-777).



What is the average height for Australian boys?

Average height of a 2-year-old boy:	86.5 cm	(range 80cm to 93cm)
Average height of a 3-year-old boy:	95 cm	(range 88.5cm to 103cm)
Average height of a 4-year-old boy:	102.5 cm	(range 94.5cm to 110.5cm)
Average height of a 5-year-old boy:	109 cm	(range 100.5cm to 118cm)
Average height of a 6-year-old boy:	116 cm	(range 106cm to 125cm)
Average height of a 7-year-old boy:	122 cm	(range 112cm to 132.5cm)
Average height of an 8-year-old boy:	128 cm	(range 117.5cm to 139cm)
Average height of a 9-year-old boy:	134 cm	(range 122.5cm to 145.5cm)
Average height of a 10-year-old boy:	139 cm	(range 126.5cm to 151.5cm)
Average height of an 11-year-old boy:	144 cm	(range 131cm to 157cm)
Average height of a 12-year-old boy:	149.5 cm	(range 135.5cm to 163.5cm)
Average height of a 13-year-old boy:	156.5 cm	(range 142cm to 171.5cm)
Average height of a 14-year-old boy:	164 cm	(range 148.5cm to 179cm)
Average height of a 15-year-old boy:	170 cm	(range 154.5cm to 184cm)
Average height of a 16-year-old boy:	173.5 cm	(range 159cm to 187cm)
Average height of a 17-year-old boy:	175 cm	(range 161cm to 188.5cm)
Average height of an 18-year-old boy:	176 cm	(range 162.5cm to 189.5cm)

What is the average weight for Australian boys?

Average height of a 2-year-old boy:	13 kg	(range 10.5kg to 15.5kg)
Average height of a 3-year-old boy:	14.5 kg	(range 12kg to 18kg)
Average height of a 4-year-old boy:	16.5 kg	(range 13.5kg to 21kg)
Average height of a 5-year-old boy:	18.5kg	(range 15kg to 24.5kg)
Average height of a 6-year-old boy:	21 kg	(range 16.5kg to 28.5kg)
Average height of a 7-year-old boy:	23.2 kg	(range 18.2kg to 32.5kg)
Average height of an 8-year-old boy:	26 kg	(range 20kg to 37.5kg)
Average height of a 9-year-old boy:	28.8 kg	(range 22kg to 43kg)
Average height of a 10-year-old boy:	32 kg	(range 24.2kg to 49.5kg)
Average height of an 11-year-old boy:	36 kg	(range 26.7kg to 56kg)
Average height of a 12-year-old boy:	40.8 kg	(range 29.7kg to 63kg)
Average height of a 13-year-old boy:	46 kg	(range 33kg to 70kg)
Average height of a 14-year-old boy:	51 kg	(range 37kg to 77kg)
Average height of a 15-year-old boy:	56.5 kg	(range 41.5kg to 83kg)
Average height of a 16-year-old boy:	61 kg	(range 46kg to 89kg)
Average height of a 17-year-old boy:	64.7 kg	(range 49.3kg to 94kg)
Average height of an 18-year-old boy:	67.2 kg	(range 52kg to 97kg)